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Titusville Amateur Radio Club

TARC NewsLetter

June 1992

FIELD DAY !!!

by Jerry Russell KC4UFI

Well, that time of the year is here or almost! By the time you read this, all the plans will have been made, all the news releases will have been mailed. All the equipment borrowed, all the antennas obtained, and nothing else to do. Yawn -- ahhh -- now I'm awake, boy have I been dreaming.

Well, Field Day this year is going to be different. I mean... no more mosquitoes (sorry Carole Anne), no more rain drenched food, no more stumbling and falling down and busting your nose (huh, Lloyd)! No more shutting down every hour to gas up the generator. This year FIELD DAY will be in the MIRACLE CITY MALL. Bud and I met with the mall management last month and finalized plans, we walked the mall down, climbed all over the roof, and generally looked in all the nooks and crannies. It isn't going to be easy but it will be fun.

We will set up just east of the middle of the mall, we plan on having about 4 to 5 tables with the gear set up about 5-6 feet from each other. We will operate as a 4A station, 4 transmitters, we can have a Novice rig setup and operating and not have it count in the overall count. So in reality we will have 5 rigs on the air. This means basically that all the contacts made on that rig will count just as the others but will not affect the 4A rating. Bands will be 40 CW, 40 Voice, 15 and 20 voice and CW. 10 meters will be assigned to the Novice station. We will install a 10 meter yagi, 40, 20, 15 meter Dipoles and an all band GAP Vertical. Ed, N4TLS, will work 2 meter SSB from his car in the parking lot for some bonus points. We need someone to work a rig, probably 2 meters, on an alternative fuel, most likely solar. Bill Young did this last year, I hope he will repeat this year. These special rigs really rake in the points! There will be an information table set up (more bonus points) to hand out ARRL information and to answer the public's questions and to recruit new members. The information table will have a rig on it to tune in on the action so the public can hear what is going on. We will also provide help to the public to go over and watch and explain what is happening at the action tables! We need a lot of help here: this table must be staffed by at least 2 and hopefully more at all times, when the mall is open.We will also have a demo table set up and will have a continuous

See Field Day on page 4.

The Editor's Desk

by Doug Reed N4QVY

The big news of the month is Field Day... I hope all are prepared to work with Jerry, KC4UFI, in support of the club down at Miracle City Mall. See his article within for details.

The SunDay Challenge seemed to go without a hitch, although I'm sure that there were some. I went down to Cliff's (KC4SYD) checkpoint on Highway 50 at the St. Johns River to watch (and hear) the action and take a few photos. Jerry (KC4UFI) had his hands full with KSC Security (including the watch commander) inquiring as to his actions. Bill (KA4VYH) certainly did a fine job on getting the message out: WMFE-FM had a news program on the race, and the Orlando Sentinel had a front page article in the second section complete with a color photo of one of the solar cars.

It is with great sadness to report that one of our long time ham friends in town, John Talbot, W4RJV, passed away earlier this month. John's radio passions included about everything from HF RTTY to slow scan to satellite. His funeral was held June 16. Our prayers and support go to his

See Desk on page3.

Officers

President: Bud Hughes K4CWG 269-0779
Vice-President: Cliff Hoag KC4SYD 267-7030
Secretary: Jerry Richards KC4YDP 459-2073
Treasurer: Walt Hart KC4VVG 267-4590

Between the Concept and Reality lies a Shadow

By Val Valek, copyright 1990

In 1976 I got my Novice license.
In 1977 I bought some a receiver and transmitter.
In 1978 I settled in my new house with a good antenna.

It was time to invest in some QSL cards. I looked at those I had received to try to determine what I wanted. Most people used one of the ten popular patterns from the four printer specializing in QSL cards.

I just wanted something just a little different.

After all, we live in one of the most exciting places in the world, where thousands work to, as Oz puts it, "hurl man and metal into space". I worked with friends trying to develop some artwork that would capture the spirit.

We drew pictures of rockets blasting out of a map of Florida, line drawings of missiles, men walking on the moon. Venturing out, we drew round, juicy oranges, sunshine, white sand beaches.

See QSL Cards on page 2

Upcoming Events

‹ › June 23, July 28, August 25- Next TARC meetings, 7 p.m., JayCees building on Singleton Ave.
‹ › June 27-28 - Field Day Event, Miracle City Mall.
‹ › Every Wednesday night - TARC Mosquito Net, 7:30 p.m., 28.333 MHz.
‹ › Every Wednesday - Brevard RACES Net, 9 a.m. and 7 p.m., 147.735 (-600).
‹ › Every Thursday night - TARC Friendship Net, 7 p.m., 146.91 MHz (-600).
‹ › 2nd Tuesday of each month - RACES meeting, 7:30 p.m., Emergency Operations Center in Rockledge (1749 Cedar Street).
‹ › 3rd Saturday of each month - SBARC / ARRL exams, 9:30 a.m. registration, FIT room Q11 in The Quad (under ham radio mast). For info call Bill Newkirk, WB9IVR, phone 724-6183.

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Grounding Techniques for Radio Installations
by Gary Coffman KE4ZV

There are three main reasons to ground radio equipment.

1. Safety grounding to protect operators from accidental electrical shock.

2. RF grounding to prevent spurious and harmonic radiation and to enhance antenna efficency.

3. Lightning protection.

Each of these require different grounding technique. A careful analysis of the ground methods used is required to determine if all three objectives are met.

Safety grounding is in many ways the easiest criteria to meet. Simply bonding all equipment cabinets to the power company ground with conductors of low resistance and adequate current carrying capacity to blow the circuit breakers will meet safety requirements.

Effective RF grounding is often much harder to achieve. The ground path must not offer any significant impedance at the frequencies of interest. Since the frequencies of interest are often octaves apart, this is challenging. The frequencies of interest are the fundamental frequency of the transmitter, the harmonic frequencies of the transmitter, and any spurious frequencies the transmitter may generate. The latter is usually the toughest.

Grounding for lightning protection is difficult due both to the magnitudes of the voltages and currents involved and to the fact that the lightning waveform is a step function and has considerable RF energy.

Probably the WORST problem one faces in designing an effective grounding system is the prevention of GROUND LOOPS. Ground loops will cause unintended currents to flow in circuitry, often with disasterous effects. Either damage or degraded operation will inevitably be the result of a ground loop.

The best method of securing a good ground for a radio installation is to use a GROUND WINDOW. The ground window technique requires that every cable that enters or leaves the radio room pass through one small area where all ground connections are made.

The power company ground must be bonded to the ground window and surge suppressors such as those marketed by Lightning Protection Associates should be installed in series with the hot wires. Note that simple shunt protectors will not be sufficient to protect the equipment in the event of a direct lightning strike. Series protectors are designed to open the circuit under severe overload.

All coaxial cables must have their shields attached to the ground window and have their inner conductors clamped with an arc cartridge designed to fail shorted. In addition the inner conductor should be fused in a manner that will open the line when the arc cartridge fails.

Telephone cables must enter through the ground window and have their leads clamped with MOVs and arc cartridges that are designed to fail shorted. In addition all leads must be fused in a manner that will open the line when the arc cartridge fails.

Each piece of equipment in the radio room must be attached to the ground window by a wide heavy strap installed so as to be as short and straight as possible. Neatness definitely does not count here.

Don't "dress" the ground cable, make it short and direct. Do not "daisy chain" grounds. Make sure that the only path from one piece of equipment to another is via the ground window. This means that interconnecting shielded cables should go from the equipment out to the ground window, have the shield bonded to the ground window, then return to the next piece of equipment. This is the only sure way to prevent circulating ground currents.

Now that every piece of equipment in the radio room is at the same potential as the ground window, the ground window must be brought to true earth ground. This is fairly easy for DC and low frequency AC, just make sure the cable is heavy enough to have the smallest possible voltage drop across it. For RF, inductance and resonance effects must be considered as well as skin effect. A wide flat copper strap that is routed as straight as possible to earth ground is preferred. For maximum lightning protection, the ground strap must never travel upward because the space charge will resist the current flow. Sharp bends will act as single turn inductances and should be avoided. Since a single ground cable will exhibit resonance at certain frequencies due to it's length, several ground cables should be used with each a different length. The lengths should be chosen such that a cable that is near a quarter wavelength at a given frequency will be paralleled by a cable that is near a half wavelength. In practice, several cables varying from the shortest possible length to twice the shortest length should be paralleled so that at least one will present a low impedance at any frequency. Do not coil the longer cables, instead fan them at the center point.

The method used to route cables down the tower will effect the degree of lightning protection achieved. If possible use a plumber's delight type of antenna that is dc grounded to the tower. Route the coax down the inside of the tower, and ground the shield of the coax to the tower at several points. This last will short out the single turn transformer formed by the tower and the shield of the cable. Unless this transformer is shorted, currents flowing in the tower to ground will induce currents in the shield of the coax.

The true ground must be more than a single stake driven into the earth. If the tower is ground mounted, use the base of the tower as the center of the ground field, otherwise drive an eight foot ground rod to form the center point of the ground field. Run radials out from the center of the ground field to a buried loop connecting a series of ground rods separated from each other by no less than eight feet. A minimum of eight rods should be used. If possible, the radials should continue outward for one quarter wavelength at the lowest frequency of operation. If your tower is not ground mounted, bring it's base ground back to the ground window using multiple lengths of cable as discussed above. Do not run a ground cable directly from the isolated tower to the true ground or a ground loop will surely be created that can allow damaging circulating currents to develop.

This all sounds like a lot of work and expense, but field experience has proven that a system like the one described will withstand direct lightning hits without loss of equipment, air time, or lives.

QSL Cards...

But it all looked pretty amateurish. I could have taken a line drawing to a graphics business, but I didn't want to spend the money.

Until this time, I had taken dime-store postcards and pasted QSL-type stickers on the back. The stickers contained a place for the rig, antenna, QTH, all the usual stuff. The QSL-card-stickers cost more than a batch of common QSL cards, but I was willing to go the extra penny per card to get something unique. Let's not forget I was spending three cents apiece for the postcards.

I found one postcard I particularly liked, a nighttime picture of the "Shuttle" on the pad, with the moon in the background. So I bought all they had at the store. But it took a long time for them to restock. It took

See QSL Cards on next page.

QSL Cards...
some doing, but I eventually got the name of the postcard distributor.

It turns out that postcards are usually handled by some poor slob working out of his car. I called the distributor, who agreed to sell me a box of 200 for only 2 cents apiece. I met him at a parking lot at UCF. What a treasure! All those pristine postcards. It got me to thinking ... could something be printed on the front of these cards right over the picture surface?

I called the neighborhood print shop. They gave me the usual tap dance that there's no such thing as white ink, since white is simply the absense of ink on white stock. I asked about possibly something like silkscreen over the picture. I know they make white paint.

We settled on silver "ink" stamped over the picture. He would do the artwork and the printing for $75. Yeah, that was a lot more than I wanted to spend, but a batch that size would last a long time. I paid in advance and was told they would be ready in about three weeks. I called after three weeks and they said, "Monday for sure." I came by on Monday and he agreed to start work on them.

I brought them home a couple days later. They were beautiful. I got many complements on them and everyone was impressed. They still had the stickers on the backs, but they looked pretty good.

Skip forward about four years. I had dropped out of ham radio for a few years and when my interest was rekindled, I searched for those QSL cards. I had only used about half, so I knew there were a lot more somewhere. Every couple months I would tear apart another room looking for the box of QSL cards.

Well, it has been a few years and I am older and wiser. Let's not sweat the small stuff. Just bite the bullet and get new QSL cards. I took a look at what is now commercially available. The full color QSLs from your own photographs are now readily available, but the result is, well, a photograph with a place for a signal report. The look and feel is just like that when you get your photos from Eckerds. Not interested.

Most people are still using the common, commercially available QSL cards. Many look very nice, but I still wanted something special. I found a picture postcard I liked at the NASA store in the Headquarters building at KSC. They cost, wow, fifteen cents a piece. I inquired about who distributes them but they steadfastly refused to give out that information. I asked if I could buy a large quantity from them at a discount. They offered to sell me a thousand at 11 cents apiece. I took them home that day.

I had one of my old QSL cards, so I went from printer to printer trying to find someone who would put my personal information on the front. No one had a means of doing it the same way it was done before. A Cape Canaveral printer said there was a gentleman in his 80s that still had the stamping machine that could do it, but he was backlogged for weeks. I said that would be fine.

I got a call three weeks later, I should come pick up the postcards. They couldn't be used. They have a slick, glossy coat that wasn't on postcards ten years earlier. The ink wouldn't adhere.

I took all those postcards back to the shop where I had bought them. My money was cheerfully refunded. I expected a hassle, but perhaps patrons often return a thousand identical postcards for refunds.

Back to square one. What to do, what to do. As I browsed through postcards in Eckerds one day, I thought, how many cards do they have to print when they run a bunch with a "Sunny Titusville" banner across the top. After several phone calls I got my answer: 5000.

Five thousand. That's a bunch. But they only cost a nickle apiece. And wouldn't they look slick. I thought more and more about it. I was ready to spend over two hundred dollars for a paltry 1000. I could get four thousand more cards for another three hundred dollars. And they have to print something on the back, so it might as well be my QSL info.

What the heck, it's only money. I drove to Longwood, where the postcard printer is located, and showed the graphics person what I wanted. They soaked me an extra hundred dollars for all my graphics stuff, and a week later I got my proofs. They had done exactly what I wanted, except I had wanted the text blocked RIGHT, not LEFT. They said it would cost me another hundred to rework the text, so I let it go.

Six weeks later I picked up my five thousand QSL cards. Taken out of context, that would sound absurd. But now that you know the chronology of my QSL card adventures, it makes sense.

Doesn't it?

Desk...
wife, Juanita, W4RJM.

Tom Downs, N4KFP, will be handling the disposition of John's ham equipment. Preliminary items are: 55 foot crank up tower that needs some minor maintenance ($150), tri-band beam (mfr unknown) that needs some insulating blocks replaced ($50), two new Alliance U110 rotors (both for $60, each for $35), several Lambda 13.6 volt 6 amp power supplies with auto-shutdown on overload, 0.4% regulation at full load ($35 each), disk storage boxes, several 3.5" and 5.25" ($1.50 each), HP200AB audio oscillator ($25). Please direct *all* inquiries to Tom at 268-2707. A newer list will be available at a later time from Tom.

Val's (WB4ZUZ) article on her experiences of buying QSL cards has finally seen the light of day. The 1990 field day article almost ran, but Steve Schindler (WD4MJJ) told me that that article sounded pretty familiar to him, so after checking with Val, found out that I had yet to run the QSL card story. Anyway, the QSL card story runs, the field day article doesn't.

Also included is an article that I found on the ARRL bulletin board on proper grounding for lightening protection. This article presents some very good ideas to consider when installing your own lightening rod (antenna mast).

Jose' (KC4VIO) wrote a letter to the editor noting his state of depression that his Christmas parade article did not run in the last issue. He also wondered about whether or not there is a TARC logo. On the old newsletter, and on the orange club vests that some of the members have, there is somewhat of a logo in the form of a triangle, hence the triangle on in the banner. It's not exact, but perhaps someone could bring their vest to the next meeting and explain the origins of the logo. Jose' also wanted to say that he feels that due to the guest speaker program, the club meetings have become much more interesting and that the camaraderie is superb.

This will be my last newsletter for TARC. I've always maintained a personal policy of positive enjoyment effectiveness: that the rewards of producing a good, quality, readable newsletter must outweigh the aggravation of putting it together. That balance has swung the other way and well, after four years, I'm pooped. I've also maintained that we should at least try to get out an issue a month and I haven't been doing that for a while. There are a lot of hams in the club with computers and desktop publishing software who are able to take over and I just hope y'all don't break down the doors at Bud's place with applications.

I would like to take the opportunity to thank all of the contributors to the newsletter over the past few years, some who were goaded into writing, some who cranked 'em out like they were getting paid. The articles when summed as a group, were a reflection of the club and its spirit. If I were to name names (and I *have* been sitting here trying to think of *all* of you), I certainly would miss someone. So here's a simple **Thank You** to the authors.

More QSL Cards...

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Amateur Radio Digital Communications, Grant 151

https://archive.org/details/tarc-news-1992-06

This **TARC Newsletter** was assembled on an Amiga 2500/30 computer using Gold Disk's Professional Page desktop publishing software and output to a LaserJet compatible laser printer. Folding, stamping, and mailing services this month will be done by the gang at Morrisons and labels will be printed up by Bud, K4CWG, who requests that any address / name / phone number corrections be directed his way. Thanks to all those involved in this maddening event.

If anyone knows of a ham needing any kind of support, whether he or she be ill or in need of an antenna raising, contact one of the individuals listed below.

Clyde Lee	K4EOS	267-9375
Lloyd Mullins	K4LTK	267-6342
Dan Boyle	K3KS	268-2469
Cliff Hoag	KC4SYD	267-7030

Titusville Repeaters

K4SJC	146.910 MHz	- 600 KHz
WB4LOE	146.970 MHz	- 600 KHz
WB4SIG	444.150 MHz CTCSS: 103.5	+ 5 MHz

W4RJV Estate Listing

AR-2002 25-550 MHZ, 800-1300 MHZ SCANNER	$250.00
HEATH HW-202 2 METER XTAL XCVR	$50.00
HEATH SA-1480 4 POSITION REMOTE COAX SW	$50.00
HEATH SB-220 2 KW HF AMPLIFIER	$725.00
HEATH SB-610 MONITOR SCOPE	$45.00
ICOM 25A 2M XCVR 10 WATTS	$125.00
ICOM AH-7000 DISCONE ANTENNA	$50.00
ICOM IC-211 2 METER ALLMODE 10 WATT XCVR	$325.00
ICOM R7000 25-1000 MHZ RCVR W/TV ADAPTER	$800.00
JRC NRD-525 20KHZ - 24 MHZ RECEIVER	$675.00
KANSAS CITY TRACKER BOARD FOR IBM PC/AT	$150.00
KENWOOD SM-220 MONITOR SCOPE W/PAN DISP	$250.00
KENWOOD TS-830S HF XCVR W/DFC-230 HEAD	$675.00
KLM ECHO-70 70CM XCVR	$100.00
OPTOELEC 2600HA LCD 1-2600 MHZ COUNTER	$135.00
RCA B/W VIDEO CAMERA	$95.00
ROBOT 400C 2-WAY COLOR SSTV CONVERTER	$225.00
ROBOT 800C CW/RTTY TERMINAL	$75.00
TANDY 600 LAPTOP W/96K RAM & MS-WORKS	$175.00
UNIVERSAL M-7000 V2.03 DEMODULATOR	$500.00
VANGUARD WEPIX 200-B RECEIVER	$75.00
VIDEO-100 COMPOSITE TV MONITOR	$45.00
YAESU G-5400B ELEV/AZIM ROTOR SYSTEM	$350.00
OSCAR ANTENNAS - 2M & 70 CM (PAIR)	$100.00
ALUMINUM CRANK-UP TOWER 55 FT	$150.00
TRI-BAND BEAM (NEEDS WORK)	$50.00
ALLIANCE U-110 ROTATORS (PAIR)	$60.00
HP200 AB AUDIO OSCILLATOR	$25.00

Contact Tom Downs, N4KFP at 268-2707 for info or demos. Offers for less than asking price will be noted for later callback in the event that the equipment is not sold.

Field Day...

display of amateur television, packet radio and a computer with Super Morse running in flash card mode. Anyone wishing to try their hand at packet or ATV can JUST DO IT! There will be a map of the U.S. in full view and we will put a colored pin in each location where a contact is made! A different color for each band (yes, I have enough pins)! This will give everyone a good overall view of the contacts being made.

I picked up 500 feet of RG8X coax at AES and all the PL259's needed to assemble five 100' sections. These will be used to feed the five antennas then they will be stored and used by the club for field days and any emergency communications we may have to provide during the year. I'm putting together stands to string up the dipoles and a sturdy base for the GAP. Cliff, KC4SYD, will provide his motor home in the parking lot for R and R and food as needed during the off hours. Remember the mall is closed at 21:00 Saturday evening and doesn't open till 12:00 Sunday. We will be locked in during this time. We will, however, have keyed access and will operate a secure simplex frequency on 2 meters to coordinate ingress and egress.

I want to personally thank all of you who have helped, made suggestions, or otherwise contributed to this effort. I want this FIELD DAY to be remembered as the one that had the highest number of participants and the fewest Mosquito Bites!!!

Titusville Amateur Radio Club
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